

Commission must reconsider its decision to allow all BAS operators in all markets to continue to operate indefinitely in an analog FM mode, using substantially more spectrum than more efficient digital operations would require, and greatly prejudicing the offering of innovative new digital MSS service at 2 GHz.

III. THE COMMISSION SHOULD NOT ACCORD BAS SUPPLEMENTAL SPECTRUM AT 2110-2130 MHZ BECAUSE BAS OPERATIONS CAN -- AND SHOULD -- BE FULLY ACCOMMODATED IN THE 2025-2110 MHZ BAND

Although the Commission noted in the 2 GHz Notice of Proposed Rulemaking that it would consider, among other options, to “require [BAS] incumbents to adopt more spectrally efficient technology to use the remaining 85 MHz at 2025-2110 MHz,”⁴⁹ it abandons this laudable goal in the 2 GHz Order by providing BAS licensees with supplemental spectrum at 2110-2130 MHz without evaluating BAS need for such spectrum. The MSS Coalition submits that BAS operations can -- and the public interest in promoting spectrum efficiency requires that they should -- be fully accommodated in the 2025-2110 MHz band.

As noted above, the Commission acknowledges in the FNPRM that broadcasters in some markets might need only five of the currently allotted seven BAS channels. If that is the case, then BAS licensees in these markets can continue to operate in an analog mode (perhaps even indefinitely) and still be accommodated in 85 MHz.

In other markets where BAS operations may require seven channels -- presumably the largest markets -- the Commission should require broadcasters to explore various

⁴⁹ *Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service*, 10 FCC Rcd 3230, 3232 (1995) (“2 GHz NPRM”).

technological means of operating in 85 MHz. These technological means may include converting from analog to digital with respect to at least some BAS channels in some markets. As explained above, digital compression will allow for BAS operations in channels of 12 MHz or less. This means that BAS operations can be accommodated in the existing 85 MHz at 2025-2110 MHz, even in larger broadcast markets, under one of several possible flexible channelization plans utilizing an analog, digital or combination digital/analog format.⁵⁰

To the extent that it is necessary for BAS licensees in some markets to convert their ENG operations to digital in order to accommodate BAS requirements in 85 MHz rather than 105 MHz, it is in the public interest that they do so for the following reasons.

A. Conversion Of BAS Operations To Digital Promotes Spectrum Efficiency

Section 1 of the Communications Act of 1934⁵¹ mandates that the Commission provide for the efficient use of radio spectrum and, pursuant to this mandate, the Commission has long encouraged more efficient use of the spectrum. Encouraging spectrum efficiency

⁵⁰ There are a number of channelization plans that will accommodate as many as 14 and as few as five ENG channels. Under one scenario, the 85 MHz of spectrum at 2025-2110 MHz could be divided into channels of 6 MHz each for a total of 14 channels. Digital compression and transmission technologies could then be employed to allow for efficient ENG operation in these 6 MHz channels. Where necessary, two adjacent 6 MHz channels could be allocated to a television station for its ENG operations if more bandwidth was required for transmission. Another alternative would be to channelize the 85 MHz in 8.5 MHz channels to support five to 10 channels. Digitally encoded signals could use a single 8.5 MHz channel and analog transmissions could use two adjacent 8.5 MHz channels (17 MHz total). The latter plan would permit the use of all digital ENG, all analog ENG, or both digital and analog ENG in a single market. See Exhibit A at 11-13.

⁵¹ 47 U.S.C. § 151.

was one of two “essential objectives” underlying the DTV Order.⁵² In a recent white paper issued on spectrum policy, FCC Deputy Chief Economist Gregory Rosston and FCC Special Counsel Jeffrey Steinberg articulated this goal as well:

the Commission should continue and expand upon the initiatives it has already taken to adopt spectrum policies that promote competition, allow maximum flexibility, encourage technical efficiency, promote innovation, facilitate seamless networks, and maximize the amount of spectrum available for use.⁵³

The Administration has similarly stressed the importance of promoting efficient use of the spectrum. In a letter to Chairman Hundt, NTIA Director Larry Irving stated:

At the same time, DTV will also make the Nation’s broadcast system more spectrum efficient -- it will permit broadcast channels to be placed more closely together than is presently possible, allowing much needed radio spectrum to be reallocated for other important uses.⁵⁴

By requiring BAS to operate in 85 MHz and thereby facilitating the introduction of MSS service (by eliminating the unnecessary BAS relocation), the Commission will significantly advance this critical objective, as well as the Congressional mandate enunciated

⁵² DTV Order at ¶¶ 4-6.

⁵³ Gregory L. Rosston and Jeffrey S. Steinberg, Using Market-Based Spectrum Policy to Promote the Public Interest, 1997 FCC LEXIS 384 (Jan. 1997). Chairman Hundt, in testimony before Congress earlier this year, endorsed this paper as “the single best summary of desirable spectrum policy” that “should generally and specifically guide the Commission’s decisions.” Statement of Reed E. Hundt, Chairman, Federal Communications Commission, on Spectrum Management Policy Before the Subcommittee on Telecommunications, Trade, and Consumer Protection, Committee on Commerce, U.S. House of Representatives, 1997 FCC LEXIS 816 (Feb. 12, 1997).

⁵⁴ Letter from Larry Irving, NTIA, to Reed Hundt, FCC at 1 (Feb. 21, 1997).

in the Telecommunications Act of 1996 to “encourage the provision of new technologies and services to the public.”⁵⁵ In addition to promoting greater spectrum efficiency, the reduced BAS allocation would allow new competition in the provision of innovative and globally seamless mobile satellite services to consumers in the United States and around the world.

Pursuant to its mandate, the Commission repeatedly has acted in other private spectrum bands to improve spectrum efficiency. For example, in response to the rapid advances in mobile technology and the overwhelming demand for private land mobile radio (“PLMR”) services spectrum, the Commission recently “refarmed” spectrum below 800 MHz for PLMR users.⁵⁶ The Commission implemented a carefully crafted migration plan whereby PLMR users funded their own migration to a more efficient channelization plan based on narrower channels. The transition plan required PLMR users to upgrade their own PLMR equipment under a phased-in approach to achieve greater spectrum efficiency. The Commission should likewise encourage more efficient spectrum use by BAS licensees in light of the vast improvement in digital technology.

B. Conversion Of BAS Operations To Digital Is Consistent With The Commission’s DTV Policies

BAS licensees’ conversion of their ENG operations to digital, where necessary, is consistent with the Commission’s strong commitment to convert the broadcast industry

⁵⁵ 47 U.S.C. §157.

⁵⁶ *See Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignment Policies of the Private Land Mobile Radio Services and Amendment of the Commission's Rules Concerning Maritime Communications*, 11 FCC Rcd 17676 (1996).

generally from an analog to a digital environment on a rapid timetable. As important, the digital conversion of all of a broadcast station's operations, including ENG operations, will provide broadcasters with substantial economic and technical benefits, including the opportunity for increased channel capacity during peak usage periods, improved picture quality and a more robust signal.⁵⁷

Given the Commission's -- and the broadcast industry's -- commitment toward rapid conversion to a digital environment, it is entirely inconsistent, illogical and contrary to the public interest for the Commission to base its decision regarding BAS operations on the assumption of continued analog BAS spectrum requirements in *all* markets. In fact, in major markets where spectrum is in greatest demand, *i.e.*, all seven channels are in use, broadcasters may very well need and want to convert their ENG operations to digital to enjoy the associated spectrum efficiency and technological benefits. And it appears that broadcasters in markets where there is sufficient BAS capacity to support continued analog operations using only 85 MHz (existing ENG channels 3-7) need not invest now in digital ENG equipment.⁵⁸ Accordingly, the Commission should limit BAS spectrum to 85 MHz and encourage broadcasters in those markets where BAS operations require seven channels to convert to

⁵⁷ For this reason, the MSS Coalition believes there is a strong basis for the Commission to require the broadcast industry, not MSS, to absorb the cost of ENG transition to digital.

⁵⁸ The Commission's decision to rechannelize the BAS band into 15 MHz channels is not without costs given that broadcasters' existing analog ENG equipment must be retrofitted to operate within the narrower channels. The investment in such a retrofit, however, will be for equipment that will become obsolete as the broadcasting industry converts over time to digital ENG operations.

digital technology.⁵⁹ Such action would be consistent with the Commission's mandate that a digital broadcast environment be fostered.

**C. Conversion Of BAS Operations To Digital Promotes
MSS/FS Sharing**

BAS licensees' conversion to digital in some markets in order to accommodate BAS operations in 85 MHz promotes the Commission's goal of encouraging sharing between MSS and FS. The Commission states in the Order that to the extent possible, MSS operators and FS operators should share the spectrum at 2165-2200 MHz (the MSS downlink band).⁶⁰ Moreover, where sharing is possible MSS operators will not be required to relocate FS incumbents.⁶¹ What the Commission fails to recognize in giving BAS licensees supplemental spectrum at 2110-2130 MHz, however, is that those common carrier FS operations that need to relocate uplinks at 2110-2130 MHz *also* must relocate paired downlinks at 2160-2180 MHz. The FS operators' focus on a paired relocation could eliminate unnecessarily the possibilities for sharing in a large portion of the 2 GHz MSS downlink band at 2165-2200. The forced relocation of FS operators at 2160-2180 MHz, therefore, means that MSS operators must relocate FS licensees out of a band where they otherwise would have been able to share. Thus, the Commission's decision to allocate 20 MHz of supplemental spectrum to

⁵⁹ Those broadcasters presumably are able to afford such conversion. As the Commission noted, "the most aggressive requirements apply to stations that we believe are most able to absorb the costs of conversion and are otherwise situated to make the transition quickly: stations affiliated with the four major networks in the largest markets." DTV Order at ¶ 86.

⁶⁰ Order at ¶ 42.

⁶¹ *Id.*

BAS results in three unnecessary relocations -- BAS into 2110-2130 MHz, FS out of 2110-2130 MHz and FS out of the paired band at 2160-2180 MHz.⁶² The Commission's action is entirely inconsistent with its own statements advocating sharing where possible.⁶³

For all of these reasons, the Commission should, upon reconsideration, provide BAS licensees with 85 MHz of spectrum between 2025-2110.

IV. THE COMMISSION'S DECISION TO IMPOSE RELOCATION COSTS ON MSS OPERATORS IS UNWARRANTED

The Commission, in its Order, imposes a huge and perhaps insurmountable burden upon 2 GHz MSS operators -- the entire cost of relocating BAS operators in the 1990-2025 MHz band and, concomitantly, the entire cost of relocating all FS operators' paired links in the 2110-2130 MHz and 2160-2180 MHz bands.⁶⁴ In addition, the 2 GHz MSS operators are required to relocate any FS operator in the 2180-2200 MHz band that receives harmful interference from MSS operations. COMSAT estimates these costs will approach \$1 billion.⁶⁵ The magnitude of these expenses -- and their detrimental attendant impact on

⁶² The Commission's 2 GHz decision also would require MSS operators to relocate FS operators in spectrum that MSS operators are not even proposing to use, *i.e.*, 2160-2165 MHz and 2110-2130 MHz.

⁶³ See 2 GHz FNPRM at ¶ 73.

⁶⁴ Relocation of FS incumbents at 2110-2130 MHz is necessary because the Commission believes that sharing between BAS and FS is not workable. See 2 GHz NPRM at 3232.

⁶⁵ The cost of implementing the Commission's Order, absent reconsideration, was developed as follows. We understand there are now approximately 3,100 paired common carrier links at 2 GHz. At a replacement cost of \$250,000 per paired link, this represents a cost of approximately \$750 million. To this figure must be added any costs to modify or replace the microwave towers; the cost of "skinnying down" the BAS analog channels; and the cost of resolving cases of harmful interference to the private operational fixed licensees at 2180-2200 MHz. . . .

MSS operations -- cannot be underestimated or ignored. Accordingly, the Commission should reconsider this decision for a number of reasons.

A. The Commission's Decision To Impose Relocation Costs On MSS Operators Was Premature

If -- as the MSS Coalition asserts -- the BAS licensees' operations can be accommodated in 85 MHz of spectrum as a result of digital compression and modulation techniques, where necessary, the Commission's decision to force the 2 GHz MSS industry to incur relocation expenses arising from the 2 GHz Order is both premature and unnecessary. As explained below, the MSS Coalition strongly opposes the Commission's decision to require MSS operators to bear the enormous expense of a "triple move" of BAS and FS licensees, because such expense would prevent altogether the development of MSS in the United States and potentially elsewhere. At a minimum, therefore, the Commission should defer a decision regarding relocation expenses until it has determined, based on a complete record, the precise spectrum needs of BAS licensees and the potential for downlink sharing.

MHz in the hopefully limited number of cases where sharing proves to be infeasible. Because, as demonstrated above, BAS operators can operate in 85 MHz, at a minimum, the Commission could avoid most of the total relocation costs by not providing BAS with supplemental spectrum in the 2110-2130 MHz band. The above costs assume that sharing is possible in the 2165-2200 MHz MSS downlink band. Of course, if sharing is not permitted, or is determined to be impossible in the downlink band, then COMSAT's earlier estimate of \$3 billion is the appropriate estimate of total relocation costs.

B. The Commission's Decision To Impose Relocation Costs On MSS Operators Was Inappropriate Because The Commission Must Resolve Issues Of Harmful Interference From BAS Operations In 1990-2025 MHz Irrespective Of Whether MSS Service Commences In The United States

The International Telecommunication Union ("ITU") Radio Regulations impose on member countries the obligation to coordinate internationally the use of radio spectrum. Thus, the United States is required to coordinate with the administration of a non-U.S. licensed MSS system filed with the ITU pursuant to the Radio Regulations to resolve potential interference problems regardless of whether the proposed MSS system intends to serve the U.S. domestic market.⁶⁶

There is substantial evidence in the record (which the Commission failed to address in its Order) that BAS operations at 1990-2025 MHz will cause interference not only to MSS systems serving the United States, but also to MSS systems serving multiple other markets outside the United States. COMSAT demonstrated in its comments previously filed with the Commission⁶⁷ that aggregate U.S. BAS transmissions in the 1990-2025 MHz band would cause interference to any non-GSO MSS satellite system⁶⁸, and thereby interfere with services being provided over satellites serving markets *outside* the United States.⁶⁹ Consequently,

⁶⁶ ITU Radio Regulations, Resolution 46 (WRC-95).

⁶⁷ COMSAT Supplemental Comments at 17 (Mar. 14, 1996); COMSAT Comments at Appendix I (May 5, 1995).

⁶⁸ For Celsat's position, see *supra* note 8.

⁶⁹ A COMSAT computer simulation (attached to its May 5, 1995 Comments at Appendix I) demonstrated that any non-GSO MSS system, including non-U.S.-licensed systems, operating in the 1990-2025 MHz band could experience unacceptable main-beam and/or aggregate sidelobe ENG interference whenever its satellites move within the field of view of U.S. BAS Footnotes (*Continued*). . . .

BAS operations in the United States likely will cause harmful interference to MSS consumers in Canada, Mexico, Latin America, and even Europe and other areas distant from the United States.

The United States must address this issue through the ITU international coordination process to ensure that MSS systems proposing to operate globally or regionally, in Region 2, can commence operations as from January 1, 2000, when the 1990-2010 MHz band becomes co-primary for MSS and FS on a global basis. Thus, even if the Commission's relocation policies effectively kept all potential MSS operators from seeking U.S. market access, the United States, nevertheless, has an obligation to coordinate U.S. BAS operations to accommodate MSS systems that will serve *other* international markets. These international negotiations to coordinate use of the 2 GHz band likely would show harmful interference to MSS systems from U.S. BAS operations. Thus, MSS systems for the most part could not operate at 2 GHz unless BAS operators vacate the band. Any attempt by the United States to deny or delay implementation of MSS worldwide would compromise international efforts spearheaded by the United States to find usable spectrum for MSS at 2 GHz, and undermine the consensus reached at WRC-95 in Resolution 716, supported by the United States, calling

transmission paths. COMSAT Comments at Appendix I (May 5, 1995). This conclusion is equally applicable to both geostationary and nongeostationary MSS systems and is consistent with a Conference Preparatory Meeting Report to WRC-95 regarding conditions for co-channel sharing among MSS and FS in the 2 GHz MSS uplink band. *See* International Telecommunications Union, Radio communication Sector, Conference Preparatory Meeting to WRC-95, Sec. 1.4.6.2 (1995).

for administrations to facilitate the use of 2 GHz for MSS and to draft plans for the gradual transfer of fixed service stations in this band.⁷⁰

Moreover, the issue of any MSS operator's obligation to pay for BAS relocation is inapplicable, when as posited here, no 2 GHz provider can absorb these costs and thereby serve the U.S. market and when the Commission has no jurisdiction over non-U.S.-licensed space segment. Therefore, it is unfair and discriminatory for the Commission to impose on MSS service providers, as a price for their U.S. market entry, costs that would have to be borne by BAS operators themselves in the absence of U.S. MSS providers.

C. The PCS Relocation Model Is Inappropriate For MSS

Although it is not entirely clear in the 2 GHz Order, the Commission's decision to impose incumbent relocation costs on MSS operators apparently was reached based on its conclusion that MSS operators should be subject to the same standards as PCS operators. These comparisons are unwarranted, however, because the circumstances faced by MSS operators in 2 GHz are entirely different from those faced by PCS operators.

First, unlike PCS, which is inherently local in nature, MSS is a national (and, indeed, international) service. This means that MSS operators would be required to relocate all FS and BAS operations throughout the country in order to operate in the 1990-2025 MHz band.⁷¹ In the case of PCS, relocation could be negotiated on a link-by-link basis in a limited

⁷⁰ ITU Radio Regulations, Final Acts of WRC-95, Article S5.389A and S5.389D; and Resolution 716 (WRC-95).

⁷¹ Even so, there are no assurances that MSS operators would have use of the 2010-2025 MHz band segment on a global basis. This is a decision for WRC-97.

geographic area. MSS operators would be faced with the enormous task of negotiating with every FS and BAS incumbent individually. The logistics and expense of simply negotiating for such relocations (above and beyond the enormous cost of the relocation itself), may render the process unworkable.

Second, unlike with PCS and FS operators, sharing between MSS and FS operations in the 2165-2200 MHz band may well be possible for an extended transition period in most areas.⁷² Thus, the Commission properly decided that it will permit, and, indeed, encourage MSS sharing with FS incumbents in the 2165-2200 MHz band.⁷³ In addition, in the FNPRM, the Commission encouraged the MSS, FS (and BAS) industries to propose complete or partial solutions to sharing problems.⁷⁴ The Commission also stated, however, that “[w]here sharing proves infeasible . . . we will allow MSS operators to relocate the incumbent FS operation to bands above 5 GHz.”⁷⁵ However, as explained below, the decision to impose FS relocation expenses on MSS operators in the FS paired links at 2110-2130 and 2160-2180 MHz in order to relocate BAS undermines the Commission’s decision to permit FS/MSS sharing where feasible in the MSS downlink at 2165-2200 MHz.

As the Commission has acknowledged, MSS and FS industry groups have to date cooperated under the auspices of TIA to resolve differences over sharing models and adopt a

⁷² This issue is the focus of a TIA study.

⁷³ Order at ¶ 42.

⁷⁴ *Id.* at ¶ 69.

⁷⁵ *Id.* at ¶ 43.

mutually acceptable set of sharing criteria that would apply in the 2165-2200 MHz band.⁷⁶

Unfortunately, if the Commission requires MSS operators to pay FS relocation costs, some incumbents could be encouraged to demand reimbursed relocation rather than continue to cooperate in efforts to share spectrum both in the paired bands at 2110-2130 and 2160-2180 MHz and in the remainder of the downlink at 2180-2200 MHz. Such a result runs directly contrary to the Commission's decision that FS and MSS operators share where possible.

Third, unlike the FS microwave incumbents in the recently allocated PCS spectrum, BAS incumbents likely will independently incur the costs of replacing their equipment when the industry converts to a digital environment on the rapid schedule mandated by the Commission in its DTV Order. Given this recent and radical change in the pace of conversion to DTV, it makes no sense for the Commission to impose BAS relocation costs on MSS operators when BAS licensees likely will upgrade their existing analog equipment to digital over some period of time regardless of whether or when MSS operations commence. MSS operators should not be forced to bear costs that BAS operators otherwise would have incurred themselves simply because of the fortuity that the 2 GHz Order pre-dated the DTV orders by a mere three weeks.

For all of these reasons, the Commission should reconsider its decision to impose both FS and BAS relocation costs on MSS operators.

⁷⁶ *Id.* at ¶ 42.

V. THE EFFECTIVE DENIAL OF MSS MARKET ACCESS AT 2 GHZ RESTRICTS COMPETITION AND IMPAIRS SATELLITE INTERESTS WORLDWIDE⁷⁷

The imposition of relocation costs in the 2 GHz band could bar or seriously impede access to the U.S. market for non-U.S.-licensed and U.S.-licensed global MSS systems, thereby limiting competition in that market solely to U.S.-licensed operators in the 1.6/2.4 GHz bands. Because the 1.6/2.4 GHz band in the United States will be fully occupied by the U.S.-licensed Big LEO global MSS providers, non-U.S.-licensed global MSS providers have sought entry to the U.S. market through spectrum at 2 GHz. Entry to the U.S. market at 2 GHz pursuant to the Commission's Order, however, would come at such enormous cost -- the expense of relocating BAS and FS incumbents -- that any non-U.S.-licensed global MSS operator, including ICO, will effectively be prevented from serving this market. Because the U.S.-licensed global MSS systems at 1.6/2.4 GHz have already received licenses and gained access to the U.S. market without having to bear such potentially burdensome costs, the Commission's treatment of non-U.S.-licensed and U.S.-licensed MSS entities at 2 GHz is unfairly discriminatory and anticompetitive.

The effective denial of access at 2 GHz is inconsistent with the United States' active promotion of open market access for global MSS to ensure that consumers around the world enjoy the maximum benefit of innovative mobile satellite services:

There must be open access to the provision of space services, subject only to spectrum availability and other limited resource factors. There should be competition among space systems and multiple service providers within each country in order to ensure

⁷⁷ PCSAT does not subscribe to the position set forth in this section.

lower costs and a broad choice of services for users. *There should be a level playing field for all systems . . .*⁷⁸

The Commission has created anything but a level playing field in the global MSS market, however. Having previously effectively blocked non-U.S.-licensed global MSS operators from operating in the 1.6/2.4 GHz band, the Commission understands that market access at 2 GHz is crucial to maintaining fair and open competition in the global MSS market. In fact, in the Report and Order allocating spectrum in the 1.6/2.4 GHz bands for MSS, the Commission specifically addressed concerns that those bands would be fully occupied by the U.S.-licensed Big LEO systems and that market entry by potential competitors in the global MSS market, including non-U.S.-licensed systems, would have to operate in other spectrum.

In comments filed in the Big LEO proceeding,⁷⁹ the Delegation of the Commission of the European Communities ("European Commission") raised concerns that the Commission's proposals for global MSS at 1.6/2.4 GHz reflected "an approach based purely on domestic US interests" with no consideration of "possible future global systems of third country or US origin, their access to the US market, and their possible licensing conditions in the US, and in particular, their use of frequency spectrum in the US."⁸⁰ In addition, the European Commission noted that the Notice of Proposed Rule Making in that proceeding:

⁷⁸ *U.S. Policy Forum Contribution to the ITU World Telecommunications Policy Forum regarding Global Mobile Personal Communications by Satellite ("GMPCS")* at 5 (emphasis added).

⁷⁹ *Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile-Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands*, 9 FCC Rcd 5936 (1994) ("Big LEO Order") (emphasis added).

⁸⁰ Comments of Delegation of the Commission of the European Communities, CC Docket No. 92-166 (June 3, 1994).

does not address the important issue of access to the 2 GHz frequency band, the relation between access to the 2 GHz band and access to the bands under discussion in the Notice, potential unfair situations resulting from the availability scenarios of the bands, and the relation to the planned future generation mobile and mobile satellite services.⁸¹

In addressing the concerns of the European Commission regarding this potential impediment to competition, the FCC in the Big LEO Order expressed its intent to promote access to the 2 GHz bands:

[W]e note the increasing demand for access to MSS spectrum worldwide and the potential value of the 2 GHz bands for the provision of MSS. We are also aware of proposals to use the 2 GHz bands for services similar and competitive to those envisaged by the Big LEO applicants. *The United States would like to facilitate access to these bands, as does the EC.*⁸²

In Comments filed in this proceeding, the Joint Project Team CEPT-ERC/ECTRA on MSS Issues also explained that: “We would be concerned, therefore, if the United States were at this stage to impose national requirements which differed from those agreed in ITU. This would not be conducive to the introduction of world-wide services.”⁸³

Despite its stated sensitivity to the need to ensure market access at 2 GHz to allow competition with the Big LEO systems operating at 1.6/2.4 GHz, the imposition of enormous relocation costs in the Order in the instant proceeding effectively bars access to the U.S. market for ICO and other potential non-U.S.-licensed competitors in the global MSS market.

⁸¹ *Id.*

⁸² Big LEO Order at 6022 (emphasis added).

⁸³ Comments of Joint Project Team CEPT-ERC/ECTRA on MSS Issues, ET Docket 95-18 (Mar. 2, 1995).

Moreover, the Order may reduce competition in satellite services in markets outside the U.S. The Commission's relocation decision establishes a precedent that could provoke other administrations to adopt similar discriminatory measures in other bands against other satellite service providers, including U.S.-licensed systems.⁸⁴

The Commission's failure to facilitate access to 2 GHz by imposing relocation costs on U.S. MSS service providers using non-U.S.-licensed space segment thus undermines the pro-competitive goals of the United States in promoting national and international competition. Although the Commission might attempt to explain its relocation decision as a matter of national sovereignty or spectrum management, foreign regulators and the international community are likely to see the practical effect of this decision for what it is -- an effective restriction on competition for the benefit of those non-geostationary MSS operators currently licensed in the United States. This may be so viewed because the FCC has historically managed transition arrangements for existing terrestrial services to accommodate the entry of new services through generally accepted methods of spectrum management and licensing policies.

⁸⁴ For example, the FCC's 2 GHz relocation decision could precipitate relocation reimbursement or compensation policies internationally, thereby potentially affecting the U.S.-licensed Big LEO MSS systems (with respect to 1.6 GHz GLONASS and Radio-Astronomy incumbent services) and other planned FSS/MSS satellite services at 30/20 GHz (with respect to incumbent terrestrial services).

CONCLUSION

For all of the foregoing reasons, the Commission should appropriately reconsider aspects of its 2 GHz decision as discussed above. Accordingly, the Commission should expeditiously grant the instant petition.

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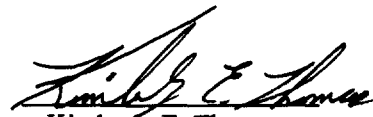
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EXHIBIT

A

**2 GHz Broadcast Auxiliary Services
(Electronic News Gathering)**

**Increased Spectrum Efficiency Through
Digital Video Compression and Transmission**

by

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Executive Summary

Technological advances in digital technology allow for the introduction of new telecommunications capabilities and enable improvements in existing communications systems. COMSAT and Hughes jointly have investigated how this technology could be applied to improve spectrum utilization efficiency for Broadcast Auxiliary Services (BAS) under the Commission's 2 GHz Order. The Commission's 2 GHz Order provides 105 MHz of spectrum at 2025 - 2130 MHz, including 20 MHz of supplemental spectrum at 2110 - 2130 MHz, for BAS operations. Our findings, summarized below, offer the FCC and the broadcast industry a means of increasing channel capacity for BAS operations, while operating in a smaller overall bandwidth within the 2 GHz spectrum.

- By applying digital compression and transmission technology, BAS licensees can conserve spectrum and operate in 85 MHz of spectrum at 2025 - 2110 MHz, a 20% reduction in required bandwidth (compared to the 2 GHz Order).

- Digital technology provides for increased channel capacity from the current 7 analog channels to as many as 14 digital channels in 85 MHz of spectrum and affords greater signal robustness in noisy environments, such as Electronic News Gathering (ENG) transmission paths, while maintaining a high audio-video (contribution quality) signal.

- An allocation of 85 MHz of spectrum will accommodate numerous rechannelization plans, including a hybrid analog / digital frequency plan to ease transition to digital ENG in selected markets. Thus, broadcasters will have the flexibility to continue analog frequency modulation (FM) transmission in less demanding TV markets that do not require the full 120 MHz of spectrum at 1990 - 2110 MHz, while converting to digital transmission in major TV markets that demand increased channel capacity afforded by digital technology.

- The digital compression technology that COMSAT and Hughes recommend the BAS licensees use to increase spectrum utilization efficiency is identical to the technology the FCC has mandated for over-the-air broadcasting of digital television.

- Digital compression and transmission equipment for BAS operations is commercially available today. Off-the-shelf digital codec and modem equipment currently used for Satellite News Gathering (SNG) transmissions can also be used for ENG transmissions without any modifications to the digital equipment.

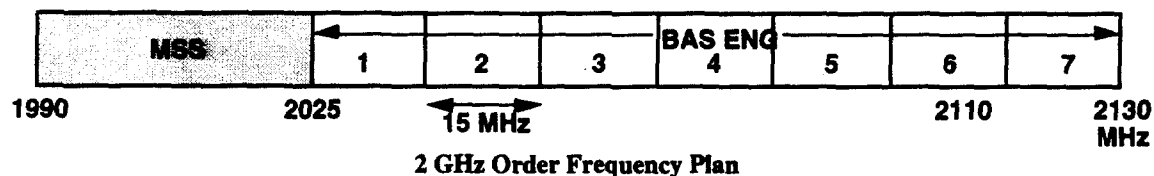
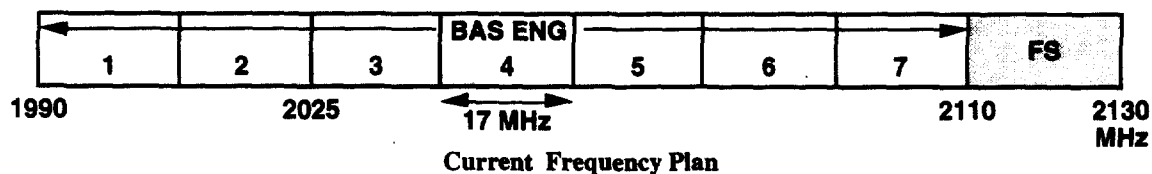
I. Introduction

This paper discusses key benefits and recent advances in digital technology. Section II describes the current analog FM transmission technology used in BAS applications, with emphasis on ENG, the predominant 1990 - 2110 MHz band application. Available spectrum efficient digital technology that permits BAS licensees to operate in the 85 MHz of spectrum at 2025 - 2110 MHz is discussed in Section III. This section also describes how broadcasters can double channel capacity within 85 MHz of spectrum by adopting digital technology. Finally, Section IV characterizes available digital codec, modem, and microwave equipment required for digital ENG transmission and offers a number of flexible rechannelization plans that minimally impact BAS operations.

Background

In January 1995, the Federal Communications Commission (FCC) released a Notice of Proposed Rulemaking (NPRM) to Allocate Spectrum at 2 GHz for use by Mobile Satellite Services (MSS) in which it sought comments on how to accommodate MSS in the 1990-2025 MHz band currently occupied by BAS in the United States. In response, COMSAT in May 1995 proposed a two-phase transition of BAS ENG operations to a more bandwidth-efficient channelization plan. The current ENG Band "A" channelization plan, which consists of six channels each of 17 MHz and one channel of 18 MHz bandwidth, is shown below.

In the 2 GHz Order, released March 14, 1997, the FCC reallocated the BAS ENG operations based, in part, on COMSAT's phase I recommendation to reduce the bandwidth per channel for ENG analog video transmissions. The new channelization plan in the 2 GHz Order provides for seven channels of 15 MHz bandwidth, between 2025 - 2130 MHz, as shown below. The FCC, however, chose not to address COMSAT's phase II recommendation that it go further and take advantage of the spectral efficiency that current digital compressed video offers for conserving BAS ENG spectrum. The FCC indicated that possible alternate channelization plans for BAS, including switching to digital equipment, would be explored in a further NPRM. COMSAT and Hughes believe that the issue of BAS conversion to a digital format is ripe for consideration now by the FCC and that use of digital technology will enable BAS to conserve spectrum and operate more efficiently.



COMSAT and Hughes Recommendation

COMSAT and Hughes believe that it is unnecessary to allocate an additional 20 MHz of spectrum to BAS at 2110 - 2130 MHz. COMSAT and Hughes recommend a single step rechannelization within the 85 MHz of spectrum allocated at 2025 - 2110 MHz for BAS